

The efficacy of salmon carcass analogs for enhancing stream and fish production in the Wind River watershed

Matthew G. Mesa

U. S. Geological Survey, Western Fisheries Research Center, Columbia River Research Laboratory, Cook, WA, 98605 matt_mesa@usgs.gov; 509-538-2299

Contemporary wild salmon populations throughout the Pacific Northwest have declined, reducing the transport of marine-derived nutrients (MDN) via salmon carcasses to spawning tributaries where juveniles rear. In an effort to restore MDN to salmon-depleted watersheds, nutrient enhancement by carcass analogs is being considered as a salmon restoration tool. We placed carcass analogs made from Chinook salmon into 500-m reaches of two streams in the Wind River watershed, Washington, to evaluate the effects of nutrient enhancement on measures of stream and fish production. We compared low level water chemistry, water quality, and periphyton, insect, and fish production between sections of streams that did or did not receive analog material. The addition of carcass analogs in the summer and fall to two oligotrophic-mesotrophic streams in the Wind River watershed significantly increased the growth of steelhead, produced mild to moderate increases in periphyton and insect production, and, for the most part, did not negatively impact water quality. The growth rates of fish in stream sections that received analogs were 10 – 150 times higher than those of fish in untreated control sections. Our results indicate that seasonal additions of analogs can provide a temporary boost in productivity to streams that may be nutrient deficient due to low runs of salmonids. However, any benefits of the nutrient subsidy we provided to these streams may be only short lived. Questions remain, for example, about whether short term increases in fish growth, such as those seen in our treatment fish, actually translate into increased overwinter survival, more productive smolt outmigrations and, ultimately, increased adult returns.